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SOME FEATURES OF THE GERMAN WORK AT THE FRANCIS W. PARKER SCHOOL

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In this paper I shall try to outline certain features of the German work of the intermediate and grammar grades of the Francis W. Parker School.

The course begins in the first year of the elementary school and extends through the high school. Few schools begin the language so early, yet we believe that by the conclusions of many leading psychologists our experiment is justified. Certainly experience has proved that the best time for beginning a foreign language is within the language period, from four to nine years. The children at this period acquire the difficult foreign sounds easily and accurately. The work, it seems to us, possesses for them not only a very great interest, but also a real educational and social value. Again, very simple work, which is necessary to everyone beginning a foreign language, is in the primary grades the natural form of expression, and there is much available material, such as songs, nursery rhymes, and games, which will give repetition and fluency in a most pleasing and economical way, while for older children beginning a language it is much more difficult to find simple material possessing both value and interest.

The acquirement of the German language, however, is not the only purpose of the work at the Francis W. Parker School. This, indeed, is a very important purpose, but we believe the

work can be of greatest social and intellectual value by making it a means of introducing the children to a new world of thought, to a world full of noble and inspiring literature, abounding in song, ballad, and legend; and particularly to a nation foremost in history and politics, in scientific research, and in education.

In the work of the Elementary School we have four definite aims in view: First, to give the children an insight into life in Germany, the manners and customs of the people, their homes and social life, for as Colonel Parker has so well said:

> A real picture of how a nation lives, the family and social relations, the education and customs, is of more philosophic value than the lives of individual men, such as Alexander, Caesar, or Napoleon; for the first furnishes the conditions through which great men become great.

A second aim is to give the pupils definite knowledge of the country, "the stage upon which the nation's history moves." A third aim is to introduce the children to the literature and music of the Fatherland. A fourth aim deals with the technique of the language, with special emphasis upon the acquirement of a good pronunciation and an adequate power of expression in the simple vocabulary of the home and school. Incidentally, a body of grammatical knowledge will be acquired, the principle of Herder being followed, that "grammar should be learned through language, not language through grammar."

In the selection of subject-matter we believe that ideal work should possess these characteristics: (1) It must be of real interest to the children or associated with some interesting experience; (2) it must have real educational value; (3) it must call forth their best efforts; (4) it must develop power; (5) it must have a social purpose, direct or indirect.

It is difficult to select the kinds of work that fulfil all the above requirements. We will present as illustrations of our material types of work which are associated with other subjects, music, art, geography, and history, hoping to show how the language work becomes a means of appreciating the German spirit from these various points of view.

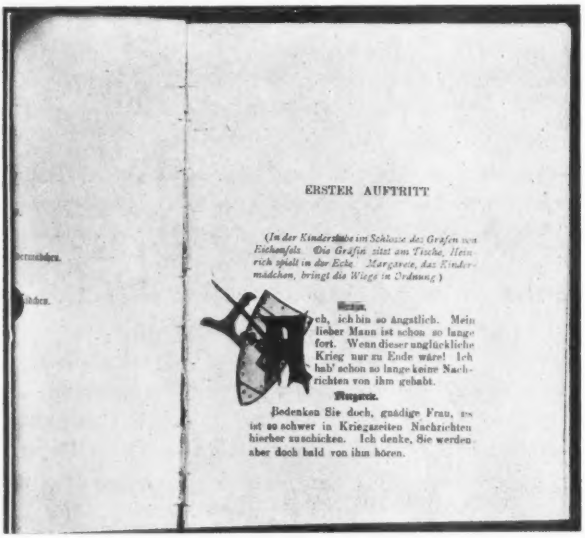
The singing of beautiful songs is of great value in develop-

ing *Sprachgefühl.* Through the legitimate appeal to the child's emotional nature it tends to enlist his heart as well as his intellect. As a well-known advocate of the reform method of modern-language instruction in Germany says: "Es wirkt belebend auf den fremdsprachlichen Unterricht." This work necessarily makes a strong demand for accurate articulation of the foreign sounds.

The observance of Christmas and other holidays at the school very often includes the singing of some of the best German songs suited to the occasion such as "Stille Nacht," "Tannenbaum," "O, heiliges Kind, wir grüssen dich!" etc. This is one of the many ways in which the language becomes the means of rendering a real service in the school community. The coming of spring makes appropriate Heine's "Frühlingsgruss" and Geibel's "Der Mai ist gekommen." The study of famous places in Germany gives opportunity for the singing of such songs as "Die Lorelei," "Der alte Barbarossa," "O Strassburg," and "Alt Heidelberg," the last three only in the grammar grades. The natural interest of children in outdoor life suggests such songs as "Im Wald und auf der Heide." To understand the national spirit of Germany there is surely no more effective way than to sing their rousing patriotic songs.

As an example of the correlation of German with art and handwork I will simply mention the composition, printing, illustrating, and binding of a little German book, entitled *das gestohlene Kind.* This story of mediaeval life, a favorite with children in Germany under the name of *Heinrich von Eichenfels,* was read by a class in the seventh and eighth grades, our text being that of Guerber in *Märchen und Erzählungen,* Vol. I. After considerable study the class made a dramatization of the story. Then followed the printing of the play, the work for the most part being done outside of school hours by the boys of the class under the direction of the teacher. One edition of the play was illustrated by the pupils with water-color sketches and by illuminated letters in the spirit of the Middle Ages. To study mediaeval books, and particularly the illuminated manuscripts, several excursions were made to the Newberry Library. There

also sketches were made of mediaeval coats of arms, weapons, etc., to be used in illustrating the story. The book was finally bound in leather. The art work and bookbinding were done under the supervision of the art teacher.



ERSTER AUFTRITT

(*In der Kinderstube im Schlosse des Grafen von Eichenfels. Die Gräfin sitzt am Tische, Heinrich spielt in der Ecke, Margarete, das Kindermädchen, bringt die Wiege in Ordnung.*)

ch, ich bin so ängstlich. Mein lieber Mann ist schon so lange fort. Wenn dieser unglückliche Krieg nur zu Ende wäre! Ich hab' schon so lange keine Nachrichten von ihm gehabt.

Bedenken Sie doch, gnädige Frau, es ist so schwer in Kriegszeiten Nachrichten hierher zuschicken. Ich denke, Sie werden aber doch bald von ihm hören.

Children who become intensely interested in a given topic in a foreign language are thereby acquiring a greater proficiency in the language itself. Obviously in looking for topics for our work it is important to consider the child's interests and the relation of the language to the other work of the grade. It has been stated by a well-known writer on pedagogy that from the eleventh to the fourteenth year among the strongest interests are hero-worship, imaginary journeys, voyages, knowledge of different peoples, and the grouping of facts by natural relations. All these interests may be united in the making of a beautiful book recording an imaginary journey in the country studied, with interesting accounts of great men associated with places visited, due attention being paid to the part played by local heroes in the country's development. With such a real motive

for careful work children accomplish surprising results. The making of a book brings home to the children the necessity for accuracy, and neatness, and at the same time unifies their work by directing all efforts toward one end.

To gives details regarding the various parts of the Teutonic world which have been studied in this way by different grades would exceed the limits allowed for this article. The following books are illustrations of this type of work:

Sixth and seventh grades, 1906, *Das Hessenland.*

Seventh grade, 1904 and 1905, *Holland.*

Seventh and eighth grades, 1907, *Südwestdeutschland* (Heidelberg; the Black Forest; Roman sites in South Germany; Influence of Roman Civilization on Germany; Strassburg; Village life in Alsace).

Eighth grade, 1905, *Die deutsche Schweiz.*

Eighth grade, 1906, *Der Rhein.*

In the making of such books we plan an itinerary involving the study of places of special interest. Immediately we are confronted by a multitude of fascinating topics: the home life; the peculiarities of the region; the places to visit, etc. After much research we endeavor to select from an increasing number of local associations those best adapted to the particular group of children. Special reading-lessons are then prepared, consisting of material bearing on the subject in hand. The work naturally requires careful study of the best maps obtainable. In addition, it is most desirable to have illustrative material in the form of pictures, charts, steamship circulars, guide books, etc.[1] Since each child is to make a book for himself, inexpensive pictures, such as postcards, can be used to good advantage.

The plan outlined provides a natural setting for choice extracts from German literature, particularly for short poems, which the pupils learn with greater interest because of the direct association with their new experiences.

It is assumed that incidentally due attention will be given to the grammatical side of the language, as well as to formal drill to acquire accuracy in expression, but the technical work

[1] See list of illustrative material given at the close of this article.

must not be allowed to obscure the purpose of the course. It is held that even in the middle grades the gaining of experience in the use of the language is of the utmost importance, and that the greatest emphasis should not be placed on technical grammar before the ninth grade.

Whatever section of the Teutonic world may be chosen for intensive study, an effort is made to relate it definitely to the work of the grade, particularly in history, geography, and, to a certain extent, with technical English.

Following are some details regarding the making of the book on *Das Hessenland* in the seventh grade, 1905. Naturally the first problem in presenting such a subject is to establish points of connection with the child's experience. The starting-point might have been stories of Charlemagne or Barbarossa, suggested by the grade work in history. As it actually happened, we began in this way: It was found that many stories, first told to children in the Hessian lands have come to be favorites with children in America, in fact with pupils in this very grade; for example, the stories of Mother Holle and some of the Grimm tales. (The author of the latter lived for years in the heart of the Hessenland and there wrote some of his best-known stories.) The work actually began with the narration by one of the members of the class of a story of Frau Holle. On investigation different versions were found, as well as additional material on the subject. We also located places like Frau Hollenteich, the Meissner Mountain Waldmannshäuschen, etc., associated with the Frau Holle legends.

Von der Frau Holle erzählt das Volk vielerlei, Gutes und Böses. Frauen, die zu ihr in den Brunnen steigen, macht sie gesund. Blumen, Obst, Kuchen, das sie unten im Teiche hat und was in ihrem Garten wächst, teilt sie denen aus, die ihr begegnen und zu gefallen wissen. Sie ist sehr ordentlich und hält auf guten Haushalt. Wenn es bei den Menschen schneit, klopft sie ihre Betten aus, davon die Flocken in der Luft fliegen. Faule Spinnerinen straft sie, indem sie ihnen den Rock besudelt, das Garn wirrt, oder den Flachs anzündet; Jungfrauen hingegen, die fleissig abspinnen, schenkt sie Spindeln und spinnt selber für sie über Nacht, dass die Spulen des Morgens voll sind.

Some attention was also given to the stories of Thor and Woden as given in *Glück auf*. Places in the Hessenland connected with the worship of the ancient gods were also located.

Wodans Sohn war Donar (Thor), der Gewittergott. Ihm brachte man Opfer unter einer grossen Eiche bei dem Dorfe Geismar in der Nähe von Fritzlar dar.

The study of pictures illustrating conditions of life in this part of the Fatherland was of very great assistance in introducing the subject.

The children now began to ask many questions about the Hessians and their picturesque country; the homes; how the people dress; how they are governed; how they make a living; what they have done in the past.

The answers to these questions required the use of much material which is either not easily accessible or which does not exist in English. Here then is a real reason for the study of the language, aside from the desire to acquire another means of expression.

The making of the book served to give unity to the work for two terms. The most valuable material on the subject was gathered from many sources: legends and historical stories of places; important facts regarding the country from a geographical point of view; composite descriptions of pictures; suitable extracts from literature, especially very easy poems. (When in the form of songs these were sometimes sung.)

The literary and historical material is simple and is in all cases associated with the topic in hand. A visit to the Goethe House in Frankfurt a/M. suggested Goethe's boyhood in the city, with mention of places that interested him most as a boy, the walls, the Römer, and the market place. One of the reading-slips gives Goethe's own words:

Am liebsten spazierte ich auf der grossen Mainbrücke. Gewöhnlich ward dann durch Sachenhausen spaziert und die Ueberfahrt gar behaglich genossen.

Die Buden auf dem Marktplatz bei der Bartholomäuskirche waren uns Kindern sehr bedeutend. Ich erinnere mich auch, dass ich immer mit Entsetzen vor den Fleischbänken geflohen bin.[2]

A visit to the "Römer," the election place of the ancient German emperors, takes us back to the legendary founding of the city by Charlemagne, the following poem being learned:

Die besten seiner Helden, sie lagen in Sachsen tot:
Da floh Karolus Magnus, der Kaiser, in grosser Not.

[2] Goethe, *Dichtung und Wahrheit.*

"Lasst eine Furt uns suchen längshin am schönen Main!
O weh, da liegt ein Nebel, der Feind ist hintendrein!"
Nun betet Kaiser Karol auf Knieen an seinem Speer,
Da teilte sich der Nebel, eine Hirschin ging daher.
Die führte ihre Jungen hinüber zum andern Strand;
So machte Gott den Franken die rechte Furt bekannt.
Hinüber zogen alle, wie Israel durch's Meer;
Die Sachsen aber fanden im Nebel die Furt nicht mehr.
Da schlug der Kaiser Karol mit seinem Schwert den Sand:
"Die Stätte sei hinfüro der Franken Furt genannt."

Several stories of Barbarossa, whose life is also at times associated with the city of Frankfurt a/M., were read, for example, "Der Schelm von Bergen;" legendary account of Barbarossa's death; Rückert's poem, "Der alte Barbarossa" (sung by class).

A ramble about the city leads to the telling of legends concerning the places we visit. As there is a wealth of interesting material on this topic the subject grows and becomes suggestive of many lines of research. Among the Frankfurt stories read were "Die Sachsenhäuser Brücke;" " Der Erfinder vom Apfelwein;" " Die '9' in der Wetterfahne."

In a similar way visits to other places in the Hessian lands help to establish points of connection with the grade work in history and geography, at the same time preparing the way for a more detailed study of these topics in the higher grades, for example, the Luther stories associated with Worms; stories of Philip the Generous and of St. Elizabeth, in connection with Marburg.

The following letter, written by a German boy of fourteen from one of the most delightful towns in the Hessenland, gives a little glimpse into the life of a boy in Germany:

EIN NEUJAHRSBRIEF AUS DEM HESSENLAND

MARBURG AN DER LAHN, d. 1. Jan. 1906

LIEBER HERR N.! Es ist sehr lange Zeit her, dass ich Ihnen geschrieben habe und ich muss doch mal sehen, wie es Ihnen geht. Hoffentlich haben Sie das Weihnachtsfest froh verlebt und das neue Jahr recht glücklich angefangen. Möge Ihnen das neue Jahr von recht grossem Vorteile sein und viel Glück und Segen bringen.

Hier ist es sehr kalt und wir laufen Schlittschuh. Leider hat es noch keinen Schnee gegeben, doch ohne Schnee geht es auch.

Wir hatten vor einigen Wochen fünf Schaumburger bei zum Kaffee und Abendbrot; da gab es viele Witze und Geschichten zu erzählen. Der Spass dauerte bis 12. Sie haben ja eine Karte erhalten, wo sich die ganze Tafelrunde unterschrieben hat. Ihre deutschen Freunde haben Sie und werden Sie niemals vergessen.

Nochmals mit vielen, vielen Grüssen, Ihr junger Freund HANS

Tausend Grüsse von Eltern und Geschwistern.

One of the best short poems on the subject is the

HESSENLIED

Hessenland, liebes Land,
Sei mir gegrüsst!
Du liegst mir stets im Sinn,
Ueberall, wo ich bin.
Hessenland, liebes Land,
Sei mir gegrüsst!

Mag es auch anderswo
Schöner noch sein,
Herzen so gut, so froh,
Find' ich doch nirgendwo.
Hessenland, traulich Land,
Sei mir gegrüsst!

The following quaint night watchman's songs from the Hessenland were memorized by the class:

LIED DER NACHTWACHE

Hört ihr Herr'n und lasst euch sagen:
Die Glocke, die hat zehne geschlagen;
Bewahret das Feuer und auch das Licht;
Dass dieser Gemeinde kein Schaden geschicht.
Und lobet Gott den Herrn.

WÄCHTERRUF UM ZEHN UHR ABENDS

Hört ihr Herr'n in dieser Nacht,
Was die Glocke geschlagen hat!
Zehne ist es an der Zeit,
Lobet Gott in Ewigkeit!
Wenn andre Leute schlafen geh'n,
Dann muss ich auf der Strasse steh'n!

Wünsch' euch all'n eine gute Nacht!
Nehmt das Feuer und Licht in Acht!
Lobet Gott den Herrn!

Examples of original descriptions of pictures are the following:

Das schöne Nationaldenkmal steht auf einem Berge, Bingen gegenüber. Die grosse Figur oben ist die Germania. Die Figur ist aus Bronze. Vorn auf dem Denkmal ist der deutsche Adler.

The picture of a quaintly dressed little Hessian girl trying to open a big door suggests the following description:

"Mach' auf, Mutter! Lass mich herein. Dort kommt ein Fremder." So spricht die kleine Greta.

"Sei nicht bange, kleines Mädchen. Ich tue dir nichts zu Leide. Wie heisst du, kleines Kind?"

"Gretchen."

"Wohnst du hier?"

"Ja."

"Ist deine Mama zu Hause?"

"Ja, sie kommt gleich."

A picture card showing peasant women and girls in picturesque costumes just leaving church, is briefly described as follows:

Diese Frauen und Mädchen kommen eben aus der Kirche. Sie tragen alle blaue Röcke, weisse Strümpfe und kleine Kopfbedeckungen. Jede Frau hat auf dem Mieder eine Anzahl Knöpfe aus Metall. Die Kirche ist aus Stein. Ueber dem Eingang sehen wir ein Kreuz.

Places of historic interest described are the following: Das Lutherdenkmal, der Lutherbaum, Worms; Schloss Wilhelmshöhe bei Kassel (Napoleon III was a prisoner here, 1870); Das Goethehaus, der Römer, Frankfurt a/M.: Die Elisabeth Kirche, Elisabethbrunnen, Marburg; Wilhelmslinde, Dillenburg.

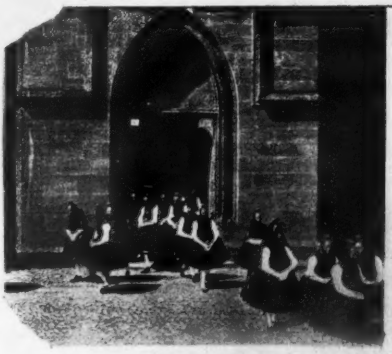
Legendary stories given are as follows: (1) Charlemagne; (2) Barbarossa; (3) St. Elisabeth (Marburg); (4) Frau Holle; (5) Der nächtliche Reiter (Dillenburg); (6) St. Boniface (Fulda); (7) Der Mäuseturm (Bingen); (8) Der Wassergeist in der Kinzig (Hanan).

The poems are as follows: Hessenlied; "Heidenröslein" (Goethe); Hessische Nachtwächterlieder; "Der alte Barbarossa;" "Gefunden" (Goethe).

Der Kirchgang in der Schwalm

Diese Frauen und Mädchen kommen eben aus der Kirche. Sie tragen alle blaue Röcke, weisse Strümpfe, weisse Ärmel, Schnallenschuhe und kleine Kopfbedeckungen. Jede Frau hat auf dem Mieder eine Anzahl Knöpfe aus Metall.

Die Kirche ist aus Stein. Über dem Eingang sehen wir ein Kreuz. Die meisten Leute sind Protestanten.



Miscellaneous: "Ein Neujahrsbrief aus dem Hessenland."

In conclusion, it has been proved to our satisfaction that the intensive study of a given section of the German speaking world, with careful recording of interesting material, has for several years in our school enlisted the best efforts of pupils in acquiring the German language, at the same time stimulating interest in all that concerns the life of the great German nation.

ILLUSTRATIVE MATERIAL

1. Lehmann Wandbilder (wall charts) (34½×26'), Verlag von F. E. Wachsmuth, Leipzig, are excellent. They may be imported through McClurg & Co., Chicago, or E. Steiger, New York City. The following subjects are especially good: (1) "Turnier" (Tournament); (2) "Lagerleben des 30-jährigen Krieges" (Camp Life in the 30-Years' War); (3) "Im Rittersaal" (In a Knight's Hall); (4) "Inneres einer Stadt, 15. Jahrhundert (Interior of a City, Fifteenth Century); (5) "Bürgerliches Wohnzimmer, 16. Jahrhundert" (Living-room of a Burgher, Sixteenth Century); (6) "Tiroler Dorf mit Volkstypen" (Tyrolese Village with Types); (7) "Der Dom zu Köln" (Cathedral at Cologne); (8) "Das Nationaldenkmal auf dem Niederwald" (National Monument); (9) "Die Berner Alpen" (Bernese Alps); (10) "Der Rhein bei Bingen" (Rhine at Bingen); (11) "Das Siebengebirge" (The Seven Mountains); (12) "Das Kyffhäuserdenkmal" (Kyffhäuser Monument).

2. Post cards can be used for illustrations in book-making or as general illustrative material. The writer has on hand duplicates of a large variety of artistic cards, such as are used in making of the books described. Address A. G. Merrill, 550 Webster Ave., Chicago, Ill.

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THE DEEPER AND THE RICHER MEANINGS OF MATHEMATICAL TEACHING IN ELEMENTARY SCHOOLS

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MODERN THOUGHT AND TENDENCIES FAVORABLE TO MATHEMATICAL EDUCATION

This is an age of industrial and economic standards. To bewail the spirit of the time as commercialism is as futile as it is unprogressive. Earnest and prudent men do not deny facts; but accept them and deal with them. Hence, educationists are attempting to put their theories into efficient relation with economic and industrial facts. Attempts to harmonize the grounds of education with the basal facts of modern industrial conditions are being integrated into the doctrine of pragmatism. Speaking roughly and roundly, this doctrine seems to mean that truth is that which works well, frees activity, liberates thinking. Utility, broadly conceived as workability, is at the bottom of it. When educational theory veers into this course, mathematics in school work readily finds for itself both fulcrum and purchase.

The watchword of industrial enterprise is the utilization of waste products. The extent to which waste products are being converted into by-products marks the present epoch. The observance or non-observance of this law of conversion makes most of the difference between industrial successes and failures. Thus industrial survival is spelled out in terms of the closeness with which raw material balances output, with which means balance ends. Wherever accuracy of adjustment of means to ends, economic balance of effort and result, are called for, there is the place and function of mathematics. In this domain mathematics comes to its birthright, and enters pre-eminently into its own.

Consequently, whether viewed from the vantage-point of the educational theorist, or of the man of affairs, the mathematical element in education is peculiarly opportune and efficacious in

the work of modern society and of social progress. But that mathematics may perform its proper office richly and liberally in educational polity, its deeper meanings must be seized and pressed into practical service. The principle of action, referred to above, that has been so well wrought out in the economic world, is freighted with significance and suggestion for the thoughtful teacher of elementary-school mathematics. This very wholesome practical doctrine has not yet been worked into the teaching of elementary-school mathematics with much thoroughness. Too large a percentage of pedagogic effort in arithmetic is devoted to mere mechanical training; and too small a proportion to educating. There are too many waste products in current processes of teaching arithmetic. No school subject, old or new, offers to well-qualified professional ability wider scope, richer opportunity, or brighter promise for improvement of output, by a completer observance of this economic law of conversion, than does school arithmetic. Lest the power of the combined evidence from educational philosophy and from practical economics fail of convincing some on this point, evidence from classroom experience may also be admitted.

MATHEMATIZED ARITHMETIC

My reason for preferring the term, elementary-school mathematics, to the customary term, arithmetic, is that the scope of the mathematical work of the modern elementary school is much broader than arithmetic, in a definitive sense. It includes form-study from the first grade through the eighth grade. It also includes the first notions of algebra under the form of general arithmetic. The form-work ripens gradually into the rudiments of geometry, before mensuration is completed. This work is all unified around an arithmetical center, and taken up at such times and places as to illuminate, to rationalize, and to reinforce the arithmetic—not primarily to prepare for high-school mathematics. In a phrase, the proper subject-matter for elementary-school mathematics may be fittingly termed *mathematized arithmetic*. It is this type of mathematical work that I have in mind, whether I use the phrase elementary-school mathematics or simply arithmetic.

DEEPER AND RICHER VALUES OF ELEMENTARY-SCHOOL MATHEMATICS

The deeper and richer meanings of elementary-school mathematics, whose importance in teaching I wish to emphasize, are:

1. Clear imaging and clear thinking.
2. Connected thinking and inference-making.
3. Concentrated thinking.
4. Independent thinking and judging.
5. Exercising the power to choose and strengthening the will.

These several virtues of mathematical work are enumerated in the order in which they should be emphasized in teaching.

In the first and second grades of many elementary schools, the arithmetical work that is done is made incidental and contributory to other school activities and subjects. No special attention is given to the number- and form-interests of children. Still the other school arts of reading and writing are begun explicitly at once. Neither the *laissez-faire* nor the occasional type of treatment is held to be good for the school arts of reading and writing in the first and second grades. For them it is conceded that a good beginning is half the battle. To me it seems a grievous error to withhold expert aid from the beginner in arithmetic as long as is customary. This is the very subject in which a poor start, or a wrong start, after working great havoc to interest and profit in school work, turns more boys and girls away from the schools, than is the case with any other school subject. The distaste that children manifest toward arithmetic is due, not to the subject-matter, but to a wrong start, or to no start at all, aggravated by poor subsequent teaching of the subject. It is the teaching, or rather the lack of it, that is the rock of offense. Boys and girls should no more be denied the opportunity of a fair start in arithmetic on the ground that they cannot do the work well, than they are denied the opportunity of getting started right in reading and writing, because at first they cannot read or write well.

THE TEACHER'S MOTIVE SHOULD BE CLEAR

But whether the programme provide help for the children at the outset or not, it is important that the teacher have clear ideas

and convictions as to the phases of number- and form-work that should receive attention during the first and second school years. Even under the plan of incidental number-teaching, the teacher may render efficient service as occasion permits, by stopping now and then to stress, or to solidify a little, a number- or form-notion met in the other work. It is even more important that this be done frequently under the incidental plan, than under the plan of explicit teaching. For children of this period are greedy for sensations about everything. Many of these sensations must pertain to number, form, and magnitude. Soon this greed for sensations results in a large mass of nuclei, or cores of concepts and images. If no aid is at hand in ordering and systematizing a little this mass of material as it accumulates, it remains an unassimilable mass of detail of little use to him who has it. Indeed it often becomes a source of general confusion of mind to him. Soon this confusion becomes more confounded by the rapidly accumulating materials of sensation, and the pupil grows perplexed and annoyed. If help be withheld at these critical moments pleasure in future arithmetical progress is doomed. All this I have so often seen, both in the classroom and outside of it, that I cannot be either mistaken or exaggerating.

PURPOSE OF SECOND-GRADE WORK TO DEFINE AND CLARIFY IDEAS OF QUANTITY

In the second school year the supply of more or less poorly defined ideas becomes unwieldy. It is imperative that some defining and clarifying of these ideas be done. The notions, started through the seeing, handling, playing, and working with things in the first grade, must be given some fulness and definiteness of outline. This is done through the "how much?" and "how many?" of number and magnitude. The distinctive purpose of the second-grade number-work should be delimiting and clarifying quantitative imagery. Simple estimates, indefinite comparison of magnitudes, and the beginnings of definite comparisons and measurements should be salient features of this year's work.

The activities and materials through which the image cores of number and magnitude should be set up are: rhythmic move-

ments, skipping plays, singing, number, rhymes, playing store, dramatic plays, committee work, making, cooking, cutting, gardening, sewing, drawing, estimating, comparing, measuring, counting rhythmically (by 2's, 5's, 10's, etc.), intuitive geometry, the number names, the digits, quick work, reading foot-rule, thermometer, and recording facts found in number dictionaries.

FORMAL WORK FOR SECOND-GRADE ARITHMETIC

The formal work of the second grade should include, at frequent intervals, such oral exercises as: "Give some numbers that, together, make 12, 14, 15," etc. Call for volunteers rapidly; write down the numbers as given, and have the class, sometimes as a whole and sometimes one at a time, add up the suggested numbers, to convince all that the numbers, taken together, do make the required number. This helps the pupil to feel the essential nature of adding, and moreover it has the psychological warrant of keeping the pupil working within a more or less vague whole to define it more fully.

Addition is thus used as a way of making vague wholes definite, as a kind of measurement. There is purpose in it for the pupil. It helps him to know some things better. Some pupil will say, directly, that 14 is a 10 and a 4. Then stop, with some such casual remark as: "Why certainly. One might see that by looking at it." Continue with enough such work to make clear the place-value of digits in two-figure numbers.

The learner thus comes first to an unknown number, as 18, *as a whole,* that he knows little about, but feels he ought to know more about. He breaks it into parts, learns it through these parts, which never get so far from the whole that the learner loses connection of whole and part. He always and continually looks at 18 in the light of its parts. This is just the opposite of the customary procedure of constructing numbers by heaping unity upon unity with the learner blindfolded as to the goal of the heaping, until the very end, when the number the teacher had in mind is reached. Under the suggested plan the constructive steps are taken in the full light of their bearing on the number, as 18, that is being learned. Then, as soon as the pupil sees that 18 is

10 and 8, ask: How many is 18 less 10? 18 less 8? thus bringing out and impressing, at once, the related character of addition and subtraction. It is wasteful in the extreme, not to teach addition and subtraction together, for ideas then have to be acquired by bits and by piecemeal. The *fragment* of an idea is difficult to acquire and next to impossible to retain.

Next, "Give some numbers that, combined, make 21, 23, 24," etc. Call for volunteers, as before. When someone says for 21, 10, and 11, stop, remarking casually: "That's what I wanted, 1 ten and 11 ones." Then treat 22, 23, etc., similarly, emphasizing as the thing you wanted, the 1, 10, and 12 ones, 1, 10, and 13 ones, etc. The bright boy will catch the point quickly; but allow the slower ones to do most of the answering, until many can at once see a two-figure number as so many tens and 11, 12, 13, 14, etc. Do not hurry the work. Give more than one day to it. This not only teaches addition at its best, but also gets ready for subtraction without the carrying and borrowing vernacular. Such work should be a feature of second-grade arithmetic. Pupils enjoy it, and so will teachers, particularly when the fruits of clear thinking and imaging begin to show. If you are skeptical about it, try it until you acquire a modicum of skill at it, and you will never return to the interest-killing unity-heaping to build numbers.

After such exercises as the foregoing, the pupil will lay hold at once of such work as: "Take 17 from 43;" thus, 7 cannot be taken from 3; but 43 is 3 tens and 13 ones; 7 from 13 leaves 6, and 1 ten from 3 tens leaves 2 tens; 2 tens and 6 ones, 26 ones. But he soon does it all more quickly than we can say it.

As 12, 14, 16, etc., are being broken into parts, ask: "Who can give 2 *equal* numbers that make 12, 14, etc.?" Then: "What number is ½ of 12, 14, 16, etc.?" Directly ask: "Who can give 3 *equal* numbers that make 12, 15, 18, etc.?" Follow at once with: "What is ⅓ of 12, 15, 18, etc.? ⅔ of 12, 15, 18, etc.?" This work suffices to show that there is an abundance of easy formal number-work adapted to second-grade immaturity, that would very materially assist in clear imaging, and would lay the foundation safe, sure, and speedy, for pleasurable and profitable

progress later. For fuller work of second-grade difficulty, see also Myers-Brooks, *Elementary Arithmetic,* Part I.

THE TIMES-IDEA AND THE TABLES

The next difficulty on the road to learning arithmetic is multiplication with its inverse operation, division. Both the times-idea and the multiplication tables should be very thoroughly and rationally taught. I am opposed to drilling, or attempting to drill these matters into children. I do not agree that learning the multiplication tables is a grim struggle of pure memory, the rigors of which can in no wise be mitigated. I am confident that the teachers of this state who give the Myers-Brooks *Elementary Arithmetic* a fair trial will agree with me before two years, if they do not now agree, that learning the tables is one of the most interesting as well as one of the most illuminating parts of arithmetic. This book first teaches, and teaches thoroughly, the tables. Then it drills amply upon them.

The most helpful pedagogic means of teaching the tables is measurement. This is not because measurement is numbering; but rather because the physical acts that must be gone through in measuring run so closely parallel to the mental steps that must be taken in numbering, that all the motor imagery of the former serves to reinforce and to guarantee the correct mental imagery of the latter. The cyclic acts of putting down, taking up, noting the end-point; again putting down, taking up, and noting the end-point, doing it again, etc., until the magnitude in question is measured, are so rhythmical, so repetitive, as to suggest inescapably the rhythmical balancing of the parts in a whole, which is the essence of the times-idea. The multiplicand is so clearly the standard of measurement, the multiplier, so clearly the number of times the standard is to be used, to be put down and taken up to give the product, that multiplication must, perforce, be sensed by the learner as a kind of actual, or imagined, measurement.

TEACHING THE MULTIPLICATION TABLE

Teaching the tables rationally includes (1) a reconnoiter of each part of the table; (2) constructing the table diagrammati-

cally, as with squares, or on squared-paper; (3) building the tables additively; (4) a first attempt at committing the tables, during which most, not all, of the committing will be done; (5) drill upon the tables, not once for all, but pretty copiously, at this stage, and then systematically for a brief time every day or two; and (6) applying the tables in problems.

In reconnoitering the part of the table being taught, the common denominate number standards that are related to the particular table in question should be used in easy problems that can be solved and understood, *by common-sense methods without the table.* This impresses the pupil with the true reason for learning the tables; viz., because they are constantly needed in common measurement. Only purposive teaching *educates;* mechanical teaching, at best, only *trains.* For example, in the 3's, 3 ft.=1 yd.; in the 4's, 4 qt.=1 gal., and 4 pk.=1 bu., and the like can be made to do valuable service, while, incidentally, most of the basal denominate number facts are taught, and much better taught, than in the old-time isolated, topical fashion. The knowledge of these facts, thus acquired, becomes a more thoroughly organic possession of pupils than the compartmental treatment makes them.

In building the tables, such facts as the following should be closely associated: $5\times6=30$; $6\times5=30$; $1/5$ of $30=6$; $1/6$ of $30=5$; $30\div6=5$; $30\div5=6$; what are the factors of 30? and such variations as: 6 5's=how many 6's? 4 7's=how many 4's? etc.; and 7 15's=how many 7's? 8 25's=how many 8's? etc.; 2 3's are 6; how many 3's in 2 6's? in 3 6's? in 5 6's? etc.; 3 6's are 18; how many 6's are 2 18's? 3 18's? 4 18's? and so on through the 6-series of products; then the 8-series; 10-series; 12-series; etc.; ¼ of 40 is 10: how many fourths of 40 is 20? 30?

Obviously, the possibilities of such work as this are unlimited. Five to ten minutes a day ought to be given to it from the third grade through the eighth. Time forbids further specifications of detail on this point; but perhaps enough has been said to make my point, that clear thinking and clear perceiving will be the sure outcome of good arithmetic teaching. It may be added that the great value of this type of formal work as training in concen-

trated and ready thinking, in mental springiness, and mechanical freedom, are among its virtues. The work must be brisk, and snap, and there must be movement and purpose to secure concentration of attention and thought. It is better to step aside from the main line of work for three to five minutes when a number difficulty is met that drill will relieve, and give the necessary drill, then pass on, than to take a whole class period for drill. No one will admit this more readily than the real teacher.

Factoring, cancellation, and checking work by casting out the nines and by other familiar processes are of great assistance in readiness and concentration of thought if these processes are not taught as separate topics for their own sake, but as matters to be used on every proper opportunity, to shorten, to facilitate, and to guarantee work.

To complete the view of the scope of the grade work as a whole we must continue a little farther.

PURPOSE OF THIRD- AND FOURTH-GRADE ARITHMETIC

The specific arithmetic duty of the third and fourth grades is to get the bulk of the tabular machinery of arithmetic under easy working control *through teaching and using* this machinery on easy problems drawn partly from the natural situations of life and partly from set lists designed to impress the particular lesson in hand.

The broader educational purpose of this period of the curriculum is to get started well the study of number and magnitude relations and connection. The beginnings and some progress in connected thinking must here be a part of the teacher's set purpose. The rational mastery of the multiplication table has this specific educational meaning and office.

FIFTH- AND SIXTH-GRADE ARITHMETIC

The fifth and sixth grades must seek especially to extend the learner's control of the four laws of addition, subtraction, multiplication, and division to fractional number, both common and decimal. The broader educational aim here is to give some

measure of control of connected thinking, inference-making, and practice in choice of means that are best suited to meet clearly defined ends. Pedagogical effort should here be directed particularly to work calculated to strengthen judgment, to encourage independence, and to confer the feeling of power actually possessed. The feeling of joy in achievement here rises to a veritable craving.

Problems must now require for their solution more than one process, and oftentimes all four of the processes, that the pupil may learn to select the appropriate process for the work, i. e., that he may be trained specifically in *when* to add, when to subtract, to multiply, or to divide, and to prove independently whether his decisions are correct. If his decision be found incorrect, he should be required himself to correct it. In my opinion, no set answers should be allowed in the classroom here. Answer books, made necessary by the demands of teachers and school officials—even correct answers—are serious obstacles in the way of independent thinking. May the time speedily come when the current tendency to cut out the obsolete and the useless and the bad may be applied to the answer pages.

THE SEVENTH- AND EIGHTH-GRADE GROUND

The new ground remaining for the seventh and eighth grades to cover is percentage and interest, and their modern applications, and mensuration. In the first of these topics the only duty of the pupil is to learn a few technical business terms and to recognize when to add, subtract, multiply, and divide, and perhaps, if the teaching is good, to learn a little of the business settings of these topics. Obsolete business topics should be excluded. As the best arithmetics are presenting the subject today, by the time the pupil reaches the seventh grade he has learned nearly all of mensuration in the study of preceding topics. It only remains in the eighth grade to systematize what has already been learned. But the most important office of these two grades is to summarize and to digest into a sort of applied science the whole of arithmetic, hitherto covered. This should be done through the agency of rationalized mensuration, on the one hand, and of generalized

number on the other. The rudiments of algebra and geometry should be associated with cognate phases of arithmetic all along. Such informal questions as

2 x's=6, or 8, or 12, etc.; what is one x?
$\frac{1}{2}x$=2, or 3, or 5, etc.; what is x?
$8+x=10$; what is x?
$7-x=4$; what is x?
$\frac{x}{4}=3$; what is x?
$ab=12$; $a=3$; what is b?
A rectangle is 3 in. high and x inches long; what is the area?
$\frac{1}{2}\pm\frac{1}{3}=\frac{3\pm 2}{2\times 3}$ etc., leading to $\frac{1}{a}\pm\frac{1}{b}=\frac{b\pm a}{a\times b}$, etc.

are all easy and enjoyable to children, and make them neighborly with the laws of numbers.

GOOD ARITHMETIC TEACHING TRAINS TO INDEPENDENCE

Well-taught elementary-school mathematics is peculiarly well adapted to strengthening the judgment. No other school subject, old or new, can surpass it in this regard. This strengthening and steadying of judgment is accomplished in three distinct ways: (1) in setting before pupils definite standards of judging, that are unequivocal, unbiased, and highly trustworthy, without being too difficult for the child's powers of comprehension; (2) by continually calling for and insisting upon the independent proving of work and the exercise of self-reliance in the class work; and (3) by developing a conscious feeling of growing power and independence.

To secure the virtues of independent judgment in arithmetic there must be no reasoning from authority, from precedent, and least of all must there be any of the so-called substantiating of conclusions on the basis of memorized rules. No school subject so completely repudiates all semblance of authority, of precedent, and custom, as does mathematics. It is *the* school subject which, in a pre-eminent degree, demands clear reasons and cogent proof for conclusions. The learner must not, at the peril of the best that arithmetic contains for him, be allowed to rely for assur-

ance of the correctness of his work either upon the teacher or upon the answers of a text. No mere working for answers, no arithmetical target-shooting, no hit-and-miss figuring and spotted thinking, and no guessing at the answer, can ever allow arithmetic teaching to come to its own kingdom in education. Steadiness and certainty of mental movement, confidence and dependability of verified results, are the very spirit and essence of arithmetic work. To miss these things in teaching it is to impoverish the subject immeasurably.

Consequently, the pupil must be taught methods of checking work, must be given different ways of arriving at the same result, must be required *habitually* to use these means of backing up results. It is not sufficient, either in school or out of school, to argue: "This is the way to solve this sort of problem: I did it this way, and did it carefully; my result must be correct." To err is human—not simply childish. It is human nature also to make the same error a second time, once it has been made, if the steps are gone over in the same way. Doing the work over again in exactly the same way, merely repeating the work, may ingrain bad habits and propensities and is so poor a guarantee of correctness as to amount practically to no guarantee at all. It is essential that the order of thought be changed, by obtaining the result in another way, or by checking by some wholly independent procedure. Only thus can we hope to develop that type of arithmetical knowledge "that knows that it knows"—the knowledge that predisposes its possessor to defend conclusions, when their reliability is challenged. And this disposition to defend one's findings must be encouraged as incipient tenacity of purpose, which is an index of the seriousness with which the pupil regards his arithmetic, rather than frowned upon as incipient pugnacity. It is the groundwork of that dogged persistence in the face of difficulties which counts at par in the world of affairs. Good arithmetic can do much to foster it.

But a *little* testing and checking will not suffice. The practice must become habitual with the pupil. When school work seeks to influence conduct, it must recognize the difference to be wide between intellectual recognition and assent and that power of

automatic control, which is a function of the spinal cord rather than the brain.

To illustrate: the arithmetic pupil must be taught the way, then trained into the habit, of proving sums correct by adding first upward; then downward; or by adding the columns in parts; then as a whole; then comparing the results by the different processes, or by checking the results of addition by casting out the nines. Comparing sums obtained in the usual way with those obtained by adding first the 10's, then the units, is also recommended when there are only two-figure numbers to be added. Much practice in obtaining sums orally is also urged; thus, for 47 and 35, say 47 and 30, 77; and 5, are 82. Analogous considerations hold good for the other three fundamental operations.

Factoring, than which there is no more illuminating subject in all arithmetic, seems rapidly becoming a lost art in the elementary school. This is unfortunate. It is a reflection upon the teaching, coming perilously near a disgrace, to see pupils who have found the lowest common multiple by the prime-factor process, actually dividing each number into the lowest common multiple to find how many times the lowest common multiple contains it; yet this is a common phenomenon even with eighth-grade pupils. Such work is wooden, and the teaching that is responsible for it is open to severe censure.

Another practicable and effective plan of fostering independence in the pupil, that deserves systematic employment, is that of giving time—even a full recitation now and then—for explicit training in "looking ahead before leaping." When a page of problems that call for several processes is reached, individual pupils should be called upon to read a problem through, orally or silently; to take reasonable time to see what the problem means—there should be business-like dispatch, but no hurrying here—and then to state, each in his own words, how he would solve it. The rest of the class should be attending to the explanation to correct any errors in its substance. The line should not be drawn too closely on the elegance of the pupil's English, though gross errors should be quickly corrected, but not dwelt upon. The first problem disposed of, without stopping to solve it pass

to the next, and so on in sufficiently rapid succession to prevent the work from dragging. Let it be rapid-fire work; keep the class a little at a loss to know "where the lightning may strike next." When a particular problem has been solved in thought, if it is not too difficult, have the solver tell also *about what the result must be.* The list of problems may then be assigned for home work, the actual solutions to be brought to class next day, or the problems may well be solved in class next day. This plan is commended as a practicable way to teach pupils *how to study.*

The following are some of the ways in which this sort of work is of explicit benefit to the learner:

1. It resolves most of the difficulty of getting the pupil to see how he may know what to do first; what next; etc. It shows him how to clear the ground for work. It reduces that biting the pencil and not knowing "whether to multiply, or to divide."

2. There is less figuring against time, or to fill the board.

3. It teaches the economy of time and effort in getting clear as to what is to be done, before setting about the doing.

4. Pupils come to sense more keenly what it is that the arithmetical processes actually do.

5. The school work helps them directly in ways of getting ideas themselves from the printed page; i. e., in how to study from books.

6. Pupils form the habit of estimating and judging closely what results must be. In decimals, there will be little of that headless not knowing where to put the point.

7. Pupils become habituated to the correct way of attacking the problems of daily life. On such problems close antecedent estimates are required, first of all.

8. Such work appeals directly first to the understanding, then to the memory.

9. Gives incidental training in the type of good English, that undertakes to say just what it means, knows when it has said it, and then stops talking.

10. Furnishes good training in knowing what you know, when you want it, i. e., in "spot-cash business." This means concentration of thought, at its best.

Every one of these phases of benefit is seen to contribute directly and materially to the learner's ability to rely on himself—to train him into the habit of self-reliance. In cases of difficulty or perplexity he calls to his help his own fund of good judgment and common-sense. He who contends that elementary mathematics is so highly perfected in purely mechanical ways as to furnish no training in judgment, but rather to replace judgment by mechanical and automatic conclusions merely, is woefully wrong as to its teaching possibilities at least.

[NOTE.—The author will continue his discussion of this subject in the March issue of this *Journal*, treating the topics: "Good Arithmetic Teaching," "A Training in Choice," "Speed and Accuracy," and "Drill Work in Arithmetic."—ED.]

FIELD-WORK AND NATURE-STUDY
PART II
THE PEDAGOGICAL ASPECT

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The point which I have tried to make is that in our attempts to teach from nature the chief sources of weakness have been: (1) our failure to appreciate the true mental attitude of the child toward his nature environment; (2) Our failure to incorporate the child's normal attitude and personal interests into our teaching procedure; (3) Our belief that the act of educating is to be accomplished by some form of step-by-step procedure through a series of lessons selected and adapted with reference to communicating to the child a certain fund of knowledge which we believe essential for him to know. Our attitude of mind is that of considering nature-knowledge as something to be learned through conscious effort; something to be acquired mainly through sheer force of will, aside from any feeling of desire or need; something to be communicated to the child through a series of logically selected and arranged lessons or topics instead of considering it as something to evolve normally out of living. We present nature to the child as a mass of fragments, as consisting of innumerable facts and details, instead of a great unit of related parts. Whether the school shall appear to the child as something normal to life or something which adults have imposed upon him to prepare him for life, a preparation for which he feels no need, depends very largely upon whether his school activities include his own personal interests and impulses or whether he meets his work as something imposed upon him. Education is as much a matter of the mental attitude of the learner as it is of subject-matter; the two things are interdependent. The quality of knowledge, the mind's interpretation of the fact, depend upon the mental

attitude of the individual at the time the fact enters the mind. The strongest associations are related to our spontaneous activities and mental attitudes. A falling meteor may be to us a sign from heaven or a fragment from another world, depending upon our mental attitude whereas in reality it may be neither. The child will put his own construction on the work we try to have him do in spite of us; whether we enlist the whole of the child in the work which we are trying to do in teaching or but a part of him depends upon how closely our methods of teaching are in accord with his mental attitudes. If our work is to be effective we must prepare the mind for the knowledge which it is to receive, and the individual's free response to his environment is one of the strongest factors in this preparation. The interest of the classroom must be able to match the interests of the streets and playgrounds if we expect to get the best results from the children. It is because of its richness, and its ability to cope with these other environmental influences that field-work claims a place in our school work.

One result of broad-sense experience is to retain plasticity in mental attitude; if the mental attitude of the individual evolves out of his own experiences it will remain plastic and keep in adjustment and harmony with increase in experience; if however, it is the product of accepted dogma or statement, something based on a statement of authority, teacher, or text-book, the mind becomes set and excludes all possibility for growth in that direction. In this matter of teaching we need to distinguish between static knowledge and dynamic knowledge. That six fours are twenty-four is a static fact; we cannot conceive of a time when it was anything to the mind but twenty-four, or of a time when it will be to the mind anything but twenty-four, and the sooner the child gets that fact fixed in his mind, when he is ready for it, the better. The fact as to the cause of variety in living forms is a different matter; it is the result of special creation, of evolution, of adaptation to environment, of survival of the fittest, of mutation—it is whatever the mind in the light of its experience conceives it to be.

In time the mind will conceive the explanation as it really is

and it will become a fixed fact, static as the fact that six fours are twenty-four.

We can cast a prophet eye into the future and conceive of a time when the mind shall have discovered all of the final facts pertaining to this earth, when all knowledge has become a static, and the mind, having exhausted the possibilities for growth, ceases its growth and proceeds to operate in some formal routine method to retain these eternal truths. But until that time arrives let us store up our knowledge, the real and the false, in reservoirs of books, and bring our efforts to bear upon bringing the child mind into rhythmic swing with the movement essential to real growth. It is to effect this that we need to bring our school work into close harmony with the spontaneous attitudes and interests of the child and to bring the whole into close contact with the realities of things in nature. It is this "abysmal difference between learning about nature and learning from nature" which we must appreciate before nature-study becomes really effective.

The general sentiment among parents and teachers seems to be that all time is wasted for children which is not spent in taking in consciously some special idea or fixing in the mind some fact, which the adult understands or thinks he understands. Some of the most successful field-excursions which I have observed, successful because of the multitude of new and rich experiences which came to the pupils and the spontaneous interest and delight with which they received them, were dismal failures in the minds of parents because the children were more conscious of the pleasures of the day than of the number of facts learned. On the other hand these same excursions have been considered of great value by adults whose spirits were never touched or quickened, who were impressed by the facts as they were pointed out, who remembered what was said, interpreted nothing, but went home with a fair collection of artificially received facts, but with a satisfied feeling of a duty well performed. Mrs. Boole's statement: "It is curious and painful to observe how many things have been proposed by true educationalists, simply for the purpose of administering to the uncon-

scious mind and afterwards perverted, by persons possessed with the teaching mania, to the purpose of stuffing into the children's minds some idea which is in the teacher's mind,"[1] is extremely pertinent in the matter of nature-study.

"The region of nature is for the child, as for savage and ignorant man, a domain of mystery and fancy." It should be the aim of the teacher to aid the child in establishing such relation with nature and its various manifestations that the reasonableness of things will appear. To the child the whole domain of nature is both strange and meaningless; to the city child the growing tendency is that it shall remain strange and meaningless. It should be the aim of field-work to aid the child to gain an acquaintance with the objects and phenomena of nature, to discover relationships, to know the things of nature as they actually are, to have nature appear to him in her reality; and above all the study should become a personal matter to the child. It should aim to turn strangeness into familiarity; convert meaningless things into things alive with meaning; it should replace fancy and mystery with reason and intelligence. Nature-study was introduced into the schools to aid the child to make this transition; to aid and direct him in gaining the personal experience essential to the transition; to assist him in accumulating, arranging, and interpreting these experiences so that the realities and truths of nature will appear; and out of the effort and activity involved should evolve adequate knowledge and power. If our own knowledge of nature has any purpose or value, it is to give us breadth of view that we may guide wisely in this matter of nature-teaching; it is surely not to be used for "stuffing" purposes. It seems that if there is any type of school work in which we should be able to move with directness of purpose it should be in this matter of nature-study.

The reasonableness, relationships, and truths of nature have always been present and constant. Nature was the same in the days when man believed this to be a flat stationary earth formed by special creation as she is today under the conception of a revolving earth and evolution. Much that is knowledge today,

[1] *The Preparation of the Child for Science.*

was the unknown of yesterday, and will be the false impressions and traditions of tomorrow. These changes are wholly a matter of human mind, brought about by a more extended and minute acquaintanceship with nature; of growth in mental power in the selection and arrangement of the relevant and irrelevant, until things finally appear to the human mind in exact or approximate accord with their appearance and action in nature.

Whatever we can sense we can understand in sense terms. Our first lessons should aim to give children ample opportunity for acquiring a wide range of sense impressions to teach them to rely upon the integrity of their senses, and to aid them in expressing with clearness this sense knowledge. There will be ample time and opportunity, later, for them to discover that the senses of individuals vary, that they do not all receive the same quality of a sensation, and that there is frequently a difference between a sense impression and a scientific fact; that what is color to the eye is as a scientific fact vibrations of light. After he has made adequate use of his senses, when he meets something that is too minute for the eye to sense, and the need arises, let him use the microscope and see how we have reinforced the senses with the lens. It is only by some such method that the child will come to value knowledge and appreciate human progress.

Nature-study demands that we give children ample opportunity to deal with the actual objects and phenomena of nature instead of compelling them to submit to talks and literature about nature. It asks that as teachers we try to understand the mental attitude of the child which results from his contact with nature, to understand what determines or controls mental attitude, and to acquire power to direct the activities aroused; rather than compel the child to gain our view-point by following in some routine way our directions. "Either method of study may have outwardly the true logical form but it is the former that is really educative."

Field-work claims a place in nature-study as a means for enriching the child's sense experience as opposed by the poverty

of the schoolroom; as furnishing ample range of valuable subject-matter from which to satisfy natural curiosity from which to choose according to interests and needs, as opposed to no choice in the matter except to attend to the work which the teacher has chosen and assigned; as offering freedom to physical and mental activity as opposed to suppression. Nature has given us every aid in this whole matter through the sensitiveness of the child to his surroundings and his insatiable curiosity. We have thwarted her at her first step in the matter by over-confinement of the child, at his most sensitive and receptive period, to the barren schoolroom. It is but what should be expected that the plea (and practice) to keep children out of our city schools until they have reached the age of eight or ten should be growing.

THE TEACHER'S OUTLOOK INTO FIELD-WORK

Field-work should begin with a comprehensive survey of the landscape as a whole. We should seek for some underlying unity which binds the whole into a balanced organism. Something which makes the topography, rocks, plants, and animals, in spite of variety, as much a part of this landscape organism as the leaves, twigs, and roots are parts of the plant organism. Our outlook into the landscape should be with a view to comprehending the whole of it, just as our study of the plant should be with a view to comprehending it as a whole. In proceeding from the landscape as a whole to its details of contour, mineral, and life, the study of these things should not become fragmentary and isolated, something apart from the landscape organism, any more than a study of leaves, twigs, roots, flowers, and fruit should become fragmentary and appear to the mind as something apart from the tree as a whole; the one set is as much an organic part of the landscape as the other is an organic part of the tree. If the landscape has a special form of topography there is a reason for it, and it is that reason which we seek; if a tree has a special form there is a reason for it and it is that reason which we wish to understand. If the landscape has a particular mineral formation, there is a reason for it; if a tree

has a peculiar leaf form or its seeds float through the air supported by a parachute of down, there is a reason for it; if vegetation is absent on an area, or we find plants without leaves there are reasons and it is these reasons for which we seek. Each set, collectively or individually, has its greatest value when seen in true relation to the whole, in its sequence of relations. In our study of our landscape environment we should seek for the dominant influence which organizes it into a great unity. This will usually be found to be some great physical event which modeled the contour of the landscape, distributed its minerals, determined its basal physical characteristic, and in so doing predetermined, directly or indirectly, all subsequent events within the area.

In our Chicago area this predetermining agent has been the lake; everywhere the region bespeaks the characteristics given it by the lake. Its ridges of sand and pebbles bespeak sandbars and spits, and on them grow the oaks; its marshes tell of barriers and inclosed lagoons, and in them have gathered a host of plants and animals adapted to a water environment. Both ridge and swamp may be traced directly to the action of the water of the lake, working under different conditions, and out of the different landscapes developed have come this difference in life. Acorns, doubtless, came to both lagoon and ridge; but only those which were dropped on the ridge grew; the seeds of the flags dropped on ridge and lagoon; but only those of the lagoon grew. The squirrels came to feed upon the acorns and live on the ridge, while the muskrats found food in the roots of flags and inhabited the swamp. To acquire the experience, and to develop power of mind in selection and arrangement, essential to having our environment appear to us as it is, to interpret the present so as to decipher the past and forecast the future—this is the fundamental purpose of field-work.

UNIT ENVIRONMENTS IN FIELD-WORK

In the evolution of the earth its surface has been modeled and molded by the forces of diastrophism, vulcanism, and gradation into great mass landscapes known as to size as conti-

nents and islands, as to elevation, as mountains, plateaus, plains. Within these mass landscapes, composing their surface are a number of minor physical regions known, according to their genesis, form, or content, as:

1. Shores and beaches of various forms with their associated features.

2. Lakelets, lagoons, marshes of various forms with their associated features.

3. Gullies, ravines, valleys of various forms with their associated features.

4. Hummocks, hills, and ridges of various forms with their associated features.

5. Levels and flats with their associated features.

Each of these type regions may be considered as a unit environment, containing its own combination of physical condition which controls the area, and unifies the various materials and phenomena within the area. The swamp is different from the ridge and both differ from the beach. Within these regions are to be found minor physical regions, such as cause zonal distribution in the marsh plants, so that we find an inner zone of water lilies, an internal zone of flags, and a border zone of sedges. A complete study of any of these type areas should lead to an acquaintance and an intelligent appreciation of the various objects and phenomena in the region, their true relation to the region as a whole, their interdependence, and the factors which control their presence, habits, and positions.

The mental content resulting from the general and detailed study of each type should, to a degree, correspond to the true facts pertaining to the region. If the action of a certain force or forces has molded the contour of the land surface of the area, and this contour has given rise to a variety in physical conditions with reference to moisture, temperature, light, air (wind), and these in turn exert control over the presence and distribution of its content of plant and animal life, then field-work should effect in us a mental attitude of recognition and appreciation of these mutual relations.

By ignoring this unity, in our treatment of subject in ele-

mentary-school work, by presenting these various phases as isolated subjects in physiography, botany, zoölogy, etc., instead of maintaining their unity through a study of the landscape itself, we have greatly reduced the effectiveness of our nature-study and science teaching and this, combined with our indoor study, has been the main reason why nature-study and elementary science have failed to exert that influence upon education which was promised by their advocates. Our problem is no longer a matter of subject-matter, it is a question of co-operation in aiding the mind to deal with the subject so abundantly at hand; of presentation and treatment in accord with the psychic stages and mental attitudes. The statement so frequently made, that teachers are not sufficiently prepared to teach nature-study and elementary science, hence their failure, is only true when we admit with it that this is not so much on account of lack of effort in the study of subject as it is that of mental attitude induced through the study.

A common type region of the Chicago area is the marsh. Something of the richness and attractiveness of this area is indicated by the number of visits which it receives annually from physiographers, botanists, zoölogists, flower-pickers, hunters, wandering children. Each comes for a special purpose; the physiographer to determine its genesis and subsequent changes; the botanist is attracted by the variety, distribution, and habits of its plants; the zoölogist by its animal life; the hunter has an eye to snipe and duck: the flower picker seeks for orchids and water lilies; to each of these the marsh is not a unit but a place where certain problems may be solved or certain things found, and they observe the things essential to their needs. The wandering children, however, approach the marsh without any prejudices, open minded, ready for any attraction the place may offer; they come with the attitude of true explorers and investigators, stirring up the ooze, splashing in the water, peering through the reeds, wading for water lilies, catching frogs, seeking for birds, alert to every sight and sound, reveling in the richness of their new experiences.

The teacher who approaches a region with her class needs to

do so in the same comprehensive way, needs to include the whole of the marsh in order to include the entire range of children's interest in the area. We may assume that from the standpoint of subject-matter an outline as follows would include this comprehensive survey.

1. Examining the area in order to gain a fairly clear impression of the general physiognomy and atmosphere of the marsh. (This impression may be expressed in a sketch or painting of the marsh or of a typical portion of it.)
2. Examining the area to determine the genesis of the marsh, and to determine the nature of the force or agent which formed it.
3. Imaging the appearance of the region at the time the marsh was born, and the changes, and the reasons for them, which the marsh has undergone since its genesis to the present time.
4. Getting acquainted with the plant life of the marsh: (*a*) variety of plants and their identification; (*b*) their zonal distribution and the factors determining this distribution; (*c*) the structures and habits of these plants which fit them to their zones; (*d*) the influence of this plant life upon the marsh.
5. (*a*) Gaining an acquaintance with the animal life of the marsh, identification, something of its habits and life history; (*b*) factors which have attracted this animal life to the region and which control its presence and distribution; (*c*) how this life reached the area; (*d*) the influence of this animal life upon the marsh.
6. Economic aspects of the region.
7. The ultimate death of the marsh and the way it may be brought about.
8. The story of the succession of changes which take place in a marsh during its birth, growth, and decline. To see the region as a place of slow action, something dynamic instead of static; to see one wave of change follow another toward the center of the area until grass land occupies the spot where water lilies grew and sparrows and field mice take the place of ducks and frogs.

It is safe to assume that the elementary student gives little attention or thought to the problems outlined. The things that appeal to him are the mud, the cat-tails, lily-pads, tadpoles, frogs, and crayfish; how the marsh got there, from whence these things came and whither they are going does not trouble him. It is sufficient that they are there and he sets to work to get all of the experience and pleasure, by observation discovery, experimentation, and collecting, which the place offers. The region as approached by the child gives him little hint of the problems

outlined; these are conceptions to be evolved out of his experiences in the marsh. Our main problem is so to direct and aid him that when the time arrives he will have the sense, data, and experience out of which to construct the complete story of the region. Our success in directing will be quite largely determined by the way in which the subject is organized in our own mind and our mental attitude toward the act of teaching.

THE SUPERINTENDENTS' VIEW OF PRESENT METHODS OF INSPIRING PROFESSIONAL INTEREST IN TEACHERS

ANNA BROCHHAUSEN
Supervising Principal, Indianapolis, Ind.

In the spring of 1907, the Department of Education of Indiana University undertook an investigation to ascertain, if possible, the superintendents' and teachers' views of prevailing methods for inspiring professional interest. The report of the teachers' view has already been given. This article endeavors to present the superintendents' view.

The following questions were sent to superintendents in different parts of the United States:

I. What is being done and what can be done to inspire professional interest through salary, increase of salary, and other kinds of promotion? Please state what teachers consider promotion, and on what promotion is based. Of what value as a stimulus is the expectation of a pension?

II. Use and importance for professional interest of "school exhibitions," "visiting days," visits from school supervising officers, and recording results of children's tests?

III. Do you have any systematic way of encouraging teachers who have grown tired and dull from teaching continually in the same grade or in too limited a field in department work? What seems to be the best remedy in such cases?

IV. In the programme of work, what arrangements are made to conserve or increase the teacher's nervous force, for example, by rest periods, alternating study and recitation periods, or other means? Do teachers teach continuously? Have you observed any special effects upon the spirit of teachers from attention to the facts suggested by this question?

V. What kind of teachers' meetings are held? In what respect are they most helpful? If you have a printed programme, will you please send it?

VI. Are special efforts made to make the individual teacher achieve substantial and recognized success? If so, how important relatively is successful teaching in keeping up interest?

VII. Kindly mention any other aspect of the matter that seems to you important.

I regret that only fourteen replies have been received, but these come from the different sections of the United States, so that probably they may be considered representative.

I. (*a*) The salary question has been and is creating a vital interest. Every reply expresses a hope for an increase in the entire schedule of salaries in the near future; or, states that there has been an increase recently. The prevailing method of increasing a teachers' salary is from a minimum to a maximum, without much consideration of the quality of the work done. That there is merit in this method is shown by the fact, that the Ethical Culture School instead of the "private arrangement between the board of governors and the individual in regard to salary," which has been their method in the past, is

> now considering a schedule which may be used with some freedom. The object of this is to eliminate any possible feeling that personal bias enters into the determination of salaries, to relieve the superintendent and principals from the very great care needed to discriminate in salary matters, between persons doing work in the same grade, and to hold out to the members of the staff the encouragement and stimulus of a maximum to be reached through faithfulness and progress.

Though this increase to a maximum based upon experience has been and is still the customary method of increase, there is a tendency now of special compensation for merit. Superintendent Small, of Providence, R. I., says: "If a community can focus more on quality of work as a basis of increased salary, I think growth would be stimulated." Superintendent Carroll, of Rochester, remarks:

> There must of course be a fixed minimum salary for all teachers when they are first elected. Increase in salary should be regular and stated until some maximum is reached. This advance should be based upon merit to the extent that no person should be advanced or retained in service who is not successful. In addition to this, some system of merit should be adopted by means of which teachers who are clearly in a class by themselves professionally, should receive a larger salary than prescribed by the maximum.

I judge that there is something like the merit system in Boulder, Colo., for Superintendent Casey says, "In this city increase is recommended when teachers show they deserve it," though he goes on to say, "A maximum is established with increase from year to year." Also in Cleveland, O., where the

teachers are grouped into three classes according to experience, the teachers are promoted to the next higher class "upon recommendation of the superintendent and the approval of the board." Superintendent Gordy, of Springfield, Mass., says, "In Springfield we have a special maximum in all the grades. For the first seven grades it is $50 above the general maximum; in the eighth grade it is $100 above; and in the ninth grade it is $200 above." These quotations show that merit is receiving financial recognition.

It is interesting in considering this question of special recognition of merit, to hear from the teachers themselves, upon the subject. By some lucky chance, a supervisor in Trenton, N. J., gave these questions to his teachers. One of these writes in reply:

> I believe that beyond a fixed maximum of salary reached by a fixed term of experience, there should be another maximum attained through successive increments by special proficiency, originality, or advanced scholarship. This will supplement the regular lines of promotion to principalships and training-school positions; first, by affording recognition to a larger number than could reasonably aspire to those limited places at the top; second, by keeping a greater number of first-class teachers in the ranks where they may serve as "the little leaven;" third, by encouraging specialization along lines of greatest interest and talent.

Another says, "There should be increases made for those teachers who are especially efficient." From another city I receive this forcible statement: "Let teachers once understand that merit, and merit alone, is the basis of promotion, and the inspiration will take care of itself."

Though merit deserves particular recognition, it is doubtful whether it alone can be made the basis of the salary schedule. Various conditions may prevent perfect justice from being done. Personal favoritism, even though unconsciously obeyed, is apt to rule a decision. Mistakes are liable simply because supervising officers are not infallible judges. Hence, a combination of the two methods, i. e., the gradual increase with experience, and the special emphasis on merit, is probably the most satisfactory scheme for salary increase. Yet there are some who hold that more pay is not always necessary for those who have special

gifts, and for those who of their own free will do extra work for their contracted salary. They argue that, "Unto whomsoever much is given of him shall be much required." Money cannot—and it is well that it cannot—pay for the highest kind of service. Few working-people, however, are willing to have this principle applied to business. They hold that the natural reward of promotion to higher positions is not always feasible and that the satisfaction which comes from work well done ought not to be the only compensation.

Fifty per cent. of the cities from which I have heard reward scholarship. In Cleveland, Ohio, college graduates are eligible to the second year of the first class. In Providence, R. I., "College graduates teaching in the grades, may be transferred to the high schools with salaries ranging from $700 to $1,800, for ladies." In Springfield, Mass., where the eighth-grade teachers may receive $100 and the ninth grade $200 above the general maximum, they look for broad scholarship in teachers of these grades; in fact, try to get as many college graduates as possible. In the District of Columbia there are "examinations for promotion in salary." The following was received from Superintendent Mott, of Richmond, Ind.:

> We pay teachers holding state licenses for more than three years (five or six, or life licenses), $50 more a year than other teachers in the same work. Again we pay teachers who receive, or have received, a Master's Degree $50 more than other teachers in the same work. These different recognitions of scholarship and merit seem to inspire study on the part of teachers.

The tendency of the times toward encouraging broader scholarship, is evident from these quotations.

There still lurks in some places the plan of having the grade determine the salary. Probably first- and eighth-year teachers should receive higher salaries than those of the grades intervening; but, to me, the principle of paying a fourth-year teacher more than a third, and a fifth-year more than a fourth, seems wrong. Frequently a good primary teacher, attracted by the higher salary enters grammar-work, where she is almost a failure.

(*b*) Only six of the superintendents answered the request

to "state what teachers consider promotion," of these, five include in their answers "higher salaries." One supplements this statement with, "or, a more desirable kind of work." Another puts it thus, "Promotion to a better-paying position." Superintendent Small adds, "Some few recognize that increased responsibility, even at the same salary, is a recognition of ability, and hence, promotion." From Cleveland, I receive the answer, "Usually a change from grade to grade up the grades looking eventually to a principalship." But with such a promotion there is an increase in salary. Possibly some will be shocked at the materialistic view of the teachers' idea of promotion. Still others will recognize that in the business world the appreciation of greater worth or value is expressed by paying a higher price. This is true not alone in the trades but in the professions. An expert lawyer or physician demands a high fee. Why should teaching be an exception?

(*c*) Of the seven who have anything to say about pensions, four consider them valueless as a stimulus, one is doubtful, and two consider them helpful. One of the last says, "We encourage teachers who are becoming tired from long service by holding out to them the prospect of a pension." One reply modifies the statement, "Of no value as a stimulus," with the clause, "unless the receiving of a pension is contingent upon meritorious (or satisfactory) service." And then adds, "Certainly, a pension, however, does relieve very many teachers from anxiety, well-based as to old age. By so much it contributes to efficiency."

Again on this subject I can quote from two replies received from Trenton. One teacher says, "Teachers themselves think little of them," and another asserts that they are a stimulus "only for those who are teaching for the money."

Whether anticipation of a pension really increases professional interest, I cannot say; but I do know that the teachers of a city where the pension system was recently inaugurated, were almost without an exception, very much pleased when the law was established. One of them in speaking to me said, "It seems too good to be true."

II. (*a*) Of the twelve who speak of school exhibitions, one

says emphatically, "School exhibits do not inspire teachers, because it is generally felt that such exhibits are 'doctored.' There is usually too much teacher and too little pupil to show the real work of the real school." Two writers are doubtful of their value. One of these gives his reason, "They take a great deal of time, and unless the work is watched carefully there is a good deal more of the teacher in the outward product than there is of the pupil." The other nine replies consider exhibits helpful. To quote from several:

> Our school exhibits have undoubtedly played an important part in stimulating the members of our staff to excellent work. The exhibit idea, however, may easily be overdone, both in respect to the frequency of the exhibits, and to their elaborate character. If an exhaustive exhibit is held every year, it is in danger of proving extremely irksome and depressing.
>
> F. C. LEWIS
> Ethical Culture School, N. Y.

> Exhibits should help to raise standards, besides creating better effort in workers.
>
> R. J. TIGHE
> Asheville, N. C.

> We give occasional exhibitions of work of the pupils, inviting parents on such days. Simply a means of fostering a closer relationship between the home and the school.
>
> WM. V. CASEY
> Boulder, Col.

> School exhibitions, if honest, are a real stimulus to the best three-fourths of the teachers; they generate healthy rivalry and stimulate new ideas.
>
> WILLARD S. SMALL
> Principal Eastern High School, Washington, D. C.

In spite of the fact that parts of an exhibit may not be the actual work of the child, I think that one who attends an exhibit in the spirit of *the learner* is stimulated. Can those of us who visited the foreign exhibits at the World's Fair say that we were not helped? Were we even questioning whether the results were children's work? If the result spoke of a better method or closer training we came away with our ideal raised and new determination. Of course, everyone will admit that there ought not to be too many of them, and each hopes that the day will come when an exhibit will consist of the children's daily work.

(*b*) Visiting is spoken of in ten of the replies. Each of these comments favorably upon this means of inspiration. One, however, contains a remark that astonishes me, viz., that it is "difficult to get more than one-third of the teachers to avail themselves of the visiting days," and that they "should be insisted upon by the administrative officers." These statements surprise me, since of the one hundred and fifty teachers who answered the questions sent out to them, only one said that she received little help from visiting, and many thought that they were not allowed to visit frequently enough. However, the above writer goes on to say, "I have never known an intelligent teacher to return from a visiting day unrefreshed."

Though some statements are unqualified in their support of visiting days as, for example, that of Superintendent Slauson, of Ann Arbor, who says, "Visiting days afford us one of the most effective means of inspiring professional interest;" others add limiting statements, such as, "valuable when directed;" "if not overdone." I will quote one reply in full:

> Visiting days, if controlled by the supervising body, so that a teacher is sent to a particular place to view particular work in which she is weak, are very stimulating. That is the course followed in this city and it is the best stimulus we find. It is varied by having a group of teachers, weak in some common line, meet the supervisor in a room where this work is very strong, and spend a session in viewing the work and discussing principles and methods involved.

Though only two speak of visiting schools in other cities, I know the custom is prevalent. I read in the Cleveland "Rules of the Board of Education," "On permission of the superintendent this privilege (visiting) shall extend to other school systems in place of our own." Superintendent Boynton, of Ithaca, N. Y., sends this word, "Once each year we close all schools and visit schools in some other city." Personally, I consider visiting schools in other cities, one of the best means of broadening the teacher's outlook.

(*c*) Only nine of the replies deal with the question of supervision, and all but one hint that the value of these visits depends upon the supervisor. Take note of these replies:

> The visits of supervising officers should be the leaven to leaven the

whole lump. Unless a teacher feels strengthened and uplifted by such visits, they had better not have been made.

Of course, visits from supervising officers depend very much upon the personality, the wisdom, and the good judgment of the officer.

Of course, the frequent visits to the classroom of those who have the responsibility for supervision are stimulating and helpful in the cultivation of professional interest, provided these visits, and the conferences that follow them, are conducted in a sympathetic and helpful manner.

I should say that the third item "Visits of supervising officers" is the most important, if the supervising officer is a true teacher, filled with the professional spirit, and has a helpful sympathizing nature.

If supervising officers say the right things at opportune times, they may be helpful to teachers.

Hence, we see that teachers and superintendents agree as to the value of supervisors' visits. They are valuable only in so far as the supervisors are gifted with a charity so broad, an experience so wide, a wisdom so discerning, and a professional spirit so vital that they are quickening in their effect.

(*d*) Of the nine statements made about children's tests, one reads, "I should not be in favor of marks or records in any grade unless it be the very last in the elementary school." Another considers them "an inspiration to about one teacher in fifteen." Two replies speak unconditionally in favor of them, viz., "Recording of tests stimulates teachers to careful and thorough work." "Unquestionably, recording results of children's tests are of considerable stimulating value to the teachers." The other five writers modify their favorable statements about tests:

Of value when not made a shibboleth.

Tests and their comparisons properly made and properly recorded should stimulate a teacher to raise the quality of her work if it is low. There is danger in some teachers becoming self-satisfied if their marks are at the head for successive periods.

Children's tests are valuable if they are made in a proper spirit, but it is very easy to make a fad of them.

Perhaps occasional tests of pupils' work stand next (to visiting) in effectiveness, provided the tests do not bear on the question of promotion, and are *fresh* and *fair*.

III. The third question, "Do you have any systematic way of encouraging teachers who have grown tired and dull?" certainly aroused interest, since every one of the fourteen who replied has had something to say upon the subject. In addition to interest, the replies show patient endeavor to give such teachers every chance for improvement. Some of the answers are concise, as e. g., "Change of work;" "Transfer to another school or to another grade or to both;" "Leave of absence with *assurance* of re-employment after a stated time of study;" "The remedy is directed to each particular case;" "We encourage them by holding out to them the prospect of a pension;" "Give them dull pupils to teach individually." The other replies are as follows:

The only remedy we have found for such cases is the inspiration of the supervisor's personally meeting such teachers, getting them to open their hearts, tell of their troubles, and by close personal contact rearouse them and lift them back to the plane from which they have slipped. Transferring them into new schools with slight changes of work but in new environment is often effective, when such transfers are represented not as punishments but as tonics.

These questions are puzzling to me. It is difficult to know what to do in the way of encouraging teachers who have fallen into routine and have reached that unfortunate stage—the stage of mental stagnation. If we could only do something to get such people out of the routine and get them interested in outside studies—but I am sure I have no suitable suggestion to offer.

Reports are required from each member of the staff. These are expected to indicate progress during the year. The constant influx of visitors, the exhibits, the supervision and the reports are intended to stimulate progress, and to prevent teachers from getting into ruts and becoming tired of their own work. With our large teaching force, it is possible for us to vary somewhat the work of individual teachers. This is not done systematically, but is attempted wherever a natural opportunity appears.

Teachers are frequently changed from one grade to another at the suggestion of the principal or supervisor. The usual means of personal interviews, grade meetings, institutes, and visitation are practically the only means at hand. In the last analysis, the principal is or ought to be the inspiration most to be relied upon. In the presence of a poor principal the condition of such a teacher as you mention is practically hopeless. Elimination is the last and necessary remedy to be applied.

The third question is a hard one. I have studied it for twenty years. A real teacher never feels in this way. In our work any good teacher who asks for a change of work is given it as soon as opportunity comes. Poorer teachers are often forced to change work that we may find where they fit best. The best remedy in such cases is for the teacher to have a "new birth."

Give them another grade, higher or lower, or department work, if fitted. I have made a good department teacher out of a poor grade teacher.

I have no regular system to apply in such cases. Simply try to show the teacher the necessity of being alive to her work; usually she is "ready to be shown."

The solution of this problem by the teachers is suggestive. They offer a variety of devices; for instance, "Get her interested in some special phase of teaching, as teaching slow, or immoral pupils; or get her to take up some special line of work as domestic science, school gardening; or help her to do something so well that the success of it will draw attention to her work and approval of it." Again, "Give them a special study to teach of which they are very fond, or change their grade." Another teacher offers three suggestions:

(1) Sufficient salary to enable them to have complete change of scene during vacation; (2) A year's leave of absence for study in some field, without loss of salary; (3) Occasional shifting from school to school, even if contrary to the temporary inclination of the teacher. Some plants require periodic transplanting to acquire new life and vigor. The influence of a new principal, new teaching associates, new classes of children, even new room, stimulates to renewal of effort.

All of these recommendations deserve thought, but few superintendents and boards of education would venture such an investment of public funds as the first two suggestions made in the last quotation. Stimulating teachers who have grown narrow, dull, or are moving in a rut has been and doubtless will continue to be a troublesome question to superintendents.

IV. Thirteen answer the question about programme; of these, six state that study alternates with recitation or that rest periods are provided. In Batavia, "Every other period she (i.e., the teacher) is assigned to the teaching of dull pupils individually. It is infinitely better than absolute rest." Superintendent Gordy writes:

We have study periods for children for two reasons: in the first place, it is better for the children to have opportunity for quiet study; in the second place, it is better for the teacher to have these rests for the nervous exhaustion. No teacher can do her best work by continuous teaching an hour or two at a time, stretching over a five-hour day. It is too much to expect if a high level of inspirational work is done during the recitation time. I have observed that the effect on the spirit of the teachers from too prolonged periods of teaching is to make them overnervous, which reacts upon the pupils and prevents good discipline, and the proper sympathetic relations between the teacher and the pupils. I regard this as a very important question.

The programme of the Ethical Culture School is so arranged that there is time when relaxation is possible; e. g., the mere presence of the teacher at chorus or assembly, and one unassigned period. Superintendent Mott says:

We, in Richmond, give most teachers two grades to teach. Generally one class recites while the other studies. However, we require that in each room programme, provision be made for one half-hour period in each half-day session for all the class or room to study, and the teachers supervise the study, or rest, or bring up odds and ends. I believe in each half-day session such a period should be provided in each programme.

In Boulder,

Study periods alternate with recitation periods, save in the primary grades and occasional double grades. We have one class in a room. An assistant teacher is provided in each building. Assistants give help where needed—to slow pupils, to pupils not up with grade work; assist with manuscript corrections, reports, etc. As to effect, have noticed no ill effects, but rather more equable temper, more enthusiastic work, and certainly profit to the pupils.

Superintendent Archer of Charleston, S. C., affirms, "We have rest periods and alternating study and recitation periods with excellent results."

In those cities where teachers teach continuously during the day, three of the superintendents think that the rest is obtained through the variety and arrangement of the subjects, and, as one adds,

This does not give the teacher opportunity for very much rest, but it does give an opportunity for rest and relaxation for the pupils themselves. This in itself is helpful and restful to the teacher. In addition there may be rest periods or study periods for the entire school.

In two of the other places where the plan of continuous teaching is followed, the superintendents doubt its wisdom. One remarks, "All of our teachers are worked too hard. . . . . I am certain our teachers are often too tired to do efficient work. Recitations drag; the work lacks force and vigor because the teacher is exhausted." And the other says, "I fear our teachers teach too continuously as they have two divisions in each class and are obliged to get through."

One writer does not consider "rest periods" for teachers a problem. He replies,

> Programmes should be made to conserve the energy of the pupil, not necessarily the teacher. With a five-hour day, there is no good reason why a healthy teacher should have rest periods. Weaklings should not be in the work. It is the fret and worry, not the work, which breaks down teachers.

One might reply to this, that investigation of the health of school children would probably show that the strain is felt not only by the teachers. Sikorsky found by dictation tests that there was an increase of 33 per cent. in the average number of mistakes made by children after four or five hours of study and recitation. Experimental schools the world over aim partly to relieve the strain which their advocates claim exists in the public schools.

In this discussion of programme arrangement, one point of view has not been mentioned. Some teachers would far rather divide the school into two classes and teach continuously, than to have one recitation period with forty or more pupils, followed by a study period for the whole school. They claim they can reach more satisfactory results through this method as it gives better opportunity for individual attention.

Possibly a helpful hint for conserving teachers' energy can be gleaned from these replies received from teachers:

> (1) Smaller classes; (2) special classes for delinquent and defective children; (3) proper sanitary conditions in the schoolroom; (4) restrooms; (5) sufficient salary to make ends meet.
>
> (1) Apparatus to lessen the mechanical work of schools; (2) liberty to change programme, e. g., on damp days; (3) a definite understanding of what line of work is to be expected during the year. (A teacher should

know before her summer vacation what grade or subject she is expected to teach the next year.) (4) a larger social life; (5) a year for study.

I had not thought particularly of the salary question as belonging to the subject of "reserving or increasing the teacher's nervous force," until I had read the teachers' replies. From these I learned that some teachers do their own cooking, much of their own sewing, and sometimes even their own laundry work. Where this is true the teacher doubtless begins the day with little reserve force.

That the establishment of special disciplinary schools, schools for the instruction of mentally deficient children and assistance in teaching very slow minds, conserves the teacher's nervous energy, is now fairy generally conceded. Special schools are part of the system in nearly all large cities. The value of individual instruction is at the basis of the Batavia system, as well as the plan of having an assistant in each building. Nevertheless, these plans also serve to guard against the over-exhaustion of the teacher.

As for the change of programme suggested in the second quotation I feel quite certain that so much liberty is tacitly given all teachers. In regard to most rules, superintendents wish to be interpreted in the spirit not the letter of the law.

That teachers are a hard-working body is generally granted. The spirit that causes them to put forth this effort is admirable, but when their exertion to accomplish produces a nervous tension, a double harm is done—the children as well as the teacher suffer.

The source of this pressure is difficult to determine. Some say it is the teacher's own fault. They do far more than is asked or expected of them. I know this to be true of some teachers. Others say, it is due to too much urging on the part of the supervising officers. Yet when one hears superintendents discuss that which is best for the teachers and reads such statements as those given above, one must acknowledge that overpressure is far from their aim.

In one respect, there is danger of the cause of the strain resting with supervising officers, viz., in their unconsciously

expecting all teachers to accomplish what only the strongest can do. There is a teacher of my acquaintance who had completed the work with her school fully four weeks before the close of the term. She tested her class and began the work of the next grade. It would be unwise, however, to plan a course of study to suit the ability of such a teacher. Extraordinary teachers can present an ideal, but cannot be taken as standards.

Still the source of the trouble has not been located. Can we find it in the public demand? No doubt part of the responsibility rests here also. In the present day, the public would not sanction the appointment of a teacher who had not had at least a high-school education. Teaching requires scholarship. This partly explains the pressure felt by some, viz., by those who are trying to acquire needful knowledge along with the attainment of present-day methods of education. The truth is we are in a transition period; and everyone who has ever passed through such an age has felt its constraining influence.

Nor is the strenuous spirit of Americans to be omitted from this consideration. We are an active people and tend to do with all our might whatever we undertake, hence we cannot look for a single cause for this complaint, nor will one remedy prove a panacea. More consideration from supervising officers, adjustment of programmes, relief from abnormal children will all help, but will not effect a cure. The teacher must have also a sustaining philosophy of life.

V. Teachers' meetings have become an established means of furthering the efficiency of teachers. Everyone is so familiar with the various kinds of meetings—the general meeting; the grade meeting, either with the superintendent, district supervisor, or supervisor of special branches; and the building meeting with the principal—that a discussion of them here would be out of place. Nevertheless, a study of the frequency and time of holding the meetings, particularly in relation to the teacher's strength, may be valuable.

As to the time of meeting, there seems to be one of two prevailing customs: either the meetings are called after school at night, some even so late as half-past four; or the school is dis-

missed for an afternoon or part of an afternoon. In addition, meetings are sometimes called on Saturdays. Generally, teachers do not favor Saturday meetings, since many of them belong to private or university extension classes that convene on that morning. On the other hand, it is sometimes impossible to get the desired speaker at any other time. In consideration of this fact, professional interest should spur those teachers who are at liberty to attend such lectures. In fact, if the meeting is called to hear some well-known lecturer, a large attendance ought always to greet that speaker.

Again, when schools are dismissed for meetings, complaint from teachers seems unjustifiable, unless there are so many meetings that they vitally hinder the work of the schoolroom. Certainly, superintendents take care that this does not happen. If they did not, the public would, by complaining of the many dismissals.

Unless it is unavoidable a meeting ought not to be called so late as half-past four. There is evidence that vitality is at its lowest at about four o'clock. If the subject of the teacher's vitality were investigated, I dare say, it would be found far below normal at that hour. Even if it were not so, many teachers would be exhausted by having their day stretched out until six o'clock.

In the previous report, I spoke of the best time of the year for holding meetings. One further caution needs to be observed, viz., the prevention, in so far as it is possible, of more than one meeting a week. If the superintendent has called a meeting, then the supervisors and principals should postpone theirs. I know this is not always practicable.

Perhaps some will say that a weekly meeting is too much. Nevertheless, if teaching is to be placed on an equal footing with the other professions, we ought willingly to give one evening a week for its study. Its science is growing so rapidly, its practice is so complicated, that the teacher must be a student to achieve success.

VI. The sixth question, "Are special efforts made to make the individual teacher achieve substantial and recognized suc-

cess?" called forth an excellent response. A fine spirit breathes through the twelve answers received, but a few quotations will suffice to show this:

> Constant efforts are made by all in direction of the schools to make each teacher achieve the fullest measure of success; successful effort is accorded merited recognition with the result of sustained interest on the part of the teachers.

> The individual teacher who is a success is encouraged to continue a success; her example is held up to the others. It is dealing with the teacher as an individual not as a *mass* that produces results. Our system with 750 teachers is not so large but that the individual can still be kept in view.

> Naturally there is more effort to make teachers individually successful than for anything else. "Nothing succeeds like success," therefore, successful teaching is, relatively, the most important of all means for keeping up interest.

VII. Only four of the superintendents have answered the seventh question. Two of these answers agree in believing that advanced study is the most stimulating means of inspiring teachers. Superintendent Small writes:

> The school department of the city and the officers of Brown University have developed a series of extension courses at the University this year, at hours convenient for the teachers. Over four hundred have elected these courses, one-half of whom are seriously studying for examinations and credits which shall count toward a future degree. . . . . I am hoping that some means may be devised whereby such teachers may receive a certain extra salary credit after a certain number of scholarship credits have been received.

Superintendent Mott states that the most important work they have been able to do along this line is the university extension work. Superintendent Tighe says,

> In making salary increase we have two reports from each principal a year to supplement the superintendent's judgment of each teacher. We also have a quarterly report on the work of each teacher from the supervisors, as an aid in determining the efficiency of teachers.

This certainly shows a close understanding between the superintendent and his assistants, which is, no doubt, a great help in promoting professional interest.

Superintendent Sanders finds that, "For a teacher to have in mind some *live question* (preferably pedagogical) is one of the very best means of inspiring professional interest."

I am aware that this report consists chiefly of quotations. However, I feel that the superintendents' replies either fully present a subject, or show clearly the two sides of a question. Further comment is unnecessary. Time, study, and earnest effort to reach the truth will decide which view is correct.

EDITORIAL NOTES

In connection with the meetings of the American Association for the Advancement of Science, held at Chicago recently, a new organization, known as the American Nature-Study Society, was completed. Previous to the time of meeting there had been appointed a committee on organization which committee had met and agreed upon the plan of organization and constitution to be recommended to the general meeting. The general meeting quickly and favorably disposed of the plans and constitution as recommended, elected officers, and proceeded at once to the discussion for which they had met. This discussion is the feature of the meeting in which, in this connection, we are particularly interested.

The topic announced was "The Relation of Nature-Study to Science-Teaching." Four widely known educational men had been invited to open the discussion, and the addresses from these men were followed by some twenty-five shorter discussions. These shorter discussions were contributed by university, college, normal-school, high-school and elementary-school people proportionately in the order in which these groups are mentioned. The nature of the general association with which this society met was such as to make the representation of elementary-school teachers in this discussion less than was desired. The following partial summarization gives those points which give promise of a more tangible organization and consequently more valuable result from work in nature-study.

If "science is organized knowledge," nature-study, high-school science so-called, and some so-called college science cannot make serious claim to inclusion in the subject. But if in education science is a process of organizing knowledge, that is of solving problems and of relating results to one another, all the above must be included. Science is kinetic, not static; and any definition which fails to recognize the method of science leaves out the moving force which educationally is the greater

part of the subject. The child who sets himself to find out about any particular natural phenomena has set himself a problem in science of the same nature as the problem which is attacked by the student doing research work on his doctor's thesis. Of course the problem is very, very much more simple but to the child it has the same features of unexplained phenomena. To explain these he must observe more phenomena, and infer and test his inferences. The research student finds his work differing from this only in degree. Indeed, sometimes the research student has furnished for him a much larger part proportionate to the amount of data needed than does the child. If we consider carefully some of the so-called pieces of research work, we shall see in them little beside an attempt to identify in a new or partially new combination of data, principles which have been clearly demonstrated in other quite similar combinations of data. Few research men are really great enough to enable them to work with combinations of data largely unstudied previously. This is not to be interpreted as meaning that verification work is not valuable and necessary, nor that a piece of such work does not become a problem to the doer, but it does assist in showing that in higher work as well as in grade work the problems may vary in quality. So far as this quality is concerned its extremes are found in the nature-study work of the elementary schools, in the research work of the university, an din all intervening science. So far as the essence of educational science is concerned there is no line drawn between nature-study and science. If, as some maintain, nature-study is wholly unlike science in its method and result, it must fail to present nature's problems, must fail to stimulate and extend inquiry into the natural features of our environment with which our lives are inextricably related. The "exposure" and "observation" methods of teaching nature-study could be no other than disappointing since they omitted the problem aspect which really gives life and meaning to the work. Merely seeing, is wholly unlike seeing with an interpreting eye and mind, and is inhibitory to interpretive seeing.

One of the prominent educational purposes of nature-study, therefore, is to establish and develop economic and trustworthy

methods of problem solving. This involves that the problems attacked must be real to the pupils and must be worth while. They must be the pupils' own problems, or must be so presented to them that the pupils feel interest in them. The best problems are those that come out of the daily life and associations of the pupils, the solutions of which bring a fuller significance to phenomena constantly observed.

In addition to this method purpose stated above, the materials acquired in nature-study furnish the concrete basis for further work of all kinds. Much advanced work loses a large part of its meaning because there is not sufficient concrete foundation to give it significance. No doubt this work would do much to make the immediate environment more attractive and to give a better interpretation of social life, and these are highly desirable. These are incidents to the larger function of supplying pictures, organization, knowledge, and processes, by means of which future thought processes may find material upon which to develop and which may enrich and organize this new material.

It must follow that if the above criteria are correct the teacher must select her material more definitely than "at random" or with the idea of preparing "busy work." One ignorant of nature or out of sympathy with it needs to begin to learn nature and thus develop sympathy, before beginning to teach it. One does not need to know all mathematics in order to teach elementary arithmetic, but one needs to have studied arithmetic at least and should have studied considerably beyond it. It is so in nature-study. Nature-study cannot be taught by those who have not studied it and who care nothing about it. It can, however, be very successfully taught by some teachers who have never had any formal courses in any natural sciences, but who of their own initiative (the best way of all) have developed insight into nature's problems and spirit.

O. W. C.

BOOK REVIEWS

Literature in the Elementary School. By Mrs. Porter Lander MacClintock, A.M. Chicago: The University of Chicago Press, 1907. Pp, ix+305.

So many books about teaching are written, and so many of them arouse in a reviewer nothing but the will to yawn, that the impulse to unreserved praise seems, even when it comes, a stranger to the heart. Yet in the case of Mrs. MacClintock's book this impulse comes to the present reviewer, and he feels timidly inclined to be wholly enthusiastic. The book is unquestionably authoritative. It is so important, so well balanced, so scientific, so artistic, so human, so exquisitely adequate to the task proposed, that it ought to become a gospel. Teachers ought to buy it as they buy dictionaries—and read it better.

It creates an ideal, but not a remote and inimitable ideal. It is not a series of bald commands to be impossibly wise and skilful. It shows by what means any teacher of respectable intelligence and taste may vastly improve herself as a teacher of literature. Take for example the ideal set up for the teaching of structure in the story. "It is a hard thing to insist upon as a matter of general theory, because written down in cold black and white, it seems to convey the impression that emphasis is placed upon mere colorless organization; as if one obliged his children to make an analytical syllabus of their pleasant tale before he regarded it as taught. But it is no such dull thing. Beauty and economy of structure lie upon the very surface of the best bits of literature, and need but the most unobtrusive reinforcement from the teacher to work their effect of pleasure and discipline. This pleasure is an artistic product which should expand and develop with the child's reading, until, when he is a mature student, the formal structure of a poem or story gives him the same aesthetic and moral satisfaction that he gets from a picture well composed, a monument well balanced. It is not a fancy or a mere pretty theory that a good story, taught as a structure, becomes a norm, a model, a clue to the child in the preservation of his own material, and in the arrangement of it economically and effectively. His attention is trained, his patience is rewarded, his judgment exercised and steadied, his imagination guided and channeled by his contact with a complete, beautiful, and logical creation, whose elements he can see and handle as he can those of the story." These words set up for the teacher an ideal sufficiently complex, but the point is that they stand at the beginning of the chapter on "Story," and that they are followed by a full discussion of the practical means by which the ideal may be realized. Not that the chapter presents a short cut of any sort, but the discussion eddies around the subject luminously, touching definite stories and their structure in a definite way.

Similar praise must be given to each of the eighteen chapters. Together they form the only complete treatment of the subject now before the public; and it is not likely that another person will soon arise who can bring to such a task so exceptional an equipment as Mrs. MacClintock's. The discussion proceeds systematically through the following topics: "The Services We May

Expect Literature to Render in the Education of Children;" "The Kinds of Literature and the Elements of Literature Serviceable in the Elementary School;" "Story;" "The Choice of Stories;" "Folk-Tale and Fairy-Story;" "Myth as Literature;" "Hero-Tales and Romances;" "Realistic Stories;" "Nature and Animal Stories;" "Symbolistic Stories, Fables, and Other Apologues;" "Poetry;" "Drama;" "The Presentation of the Literature;" "The Return from the Children;" "The Correlations of Literature;" "Literature out of School, and Reading Other Than Literature;" "A Course in Literature for the Elementary School."

To attempt to summarize these chapters is like attempting to judge the organic unity of a course of instruction by a half-hour's visit to a single recitation. All teachers who themselves resent being judged by such methods should appreciate the reviewer's restraint at this point, and should manifest the same by possessing themselves of the book. They should not rest until, in various parts of the volume, they have read what is said of "Enoch Arden," Hawthorne's *Pandora*, the Henty books, *Emmy Lou, The Midsummer Night's Dream, Robinson Crusoe, Story of the Dandelion, The Little White Hen, Peter Pan,* and *The Child's Garden,* and have pondered the reasons—often far-reaching and profound—for what is said. The sanity with which these things and a hundred others are treated may fairly be considered a touchstone to which any teacher may profitably bring any piece of literature concerning which she is in doubt. And as for the last four chapters of the book, let us hope that teachers inspired to new hope and effort by them may have some influence with boards of education.

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